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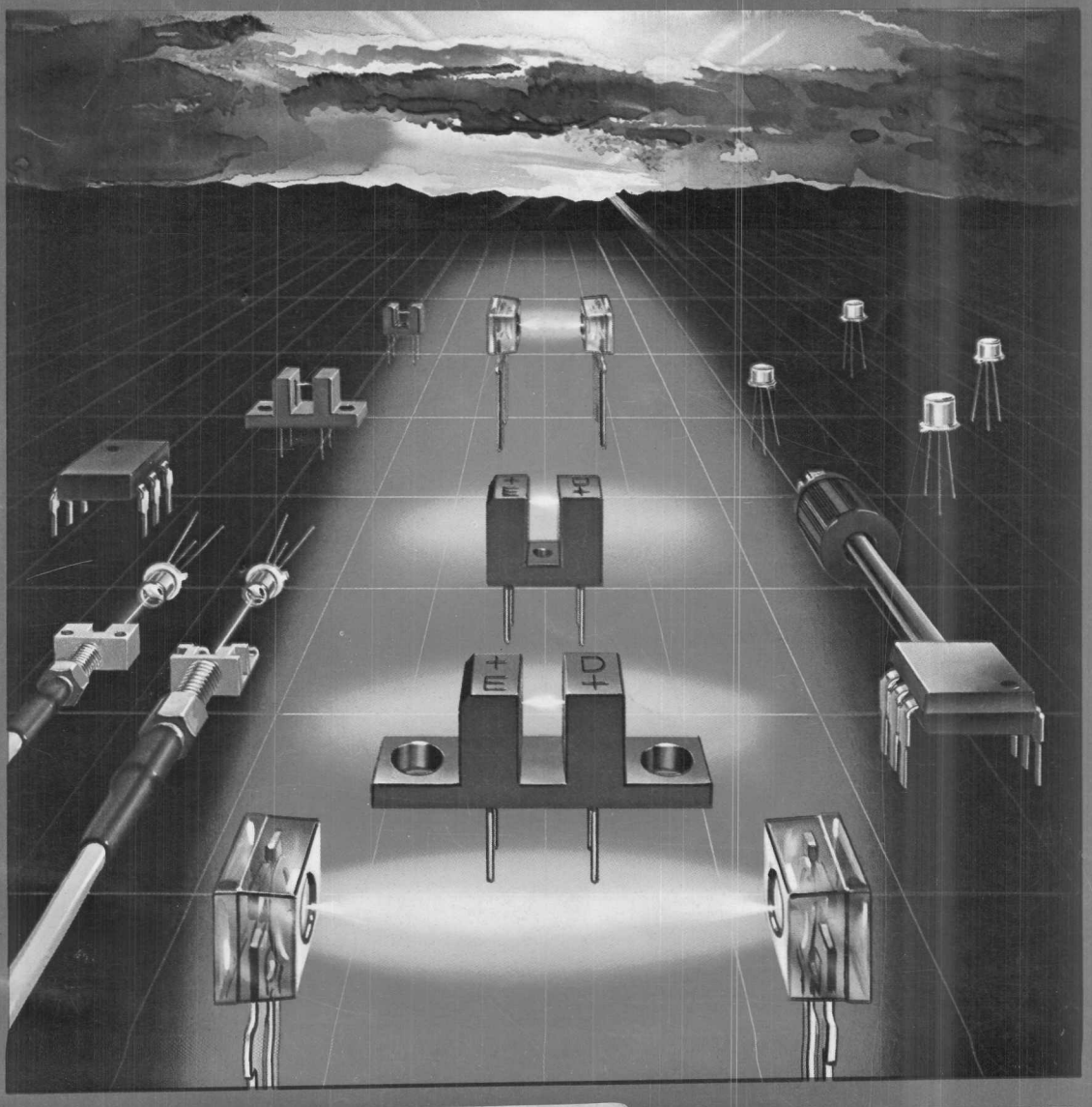
Optoelectronics

Selector Guide & Cross Reference



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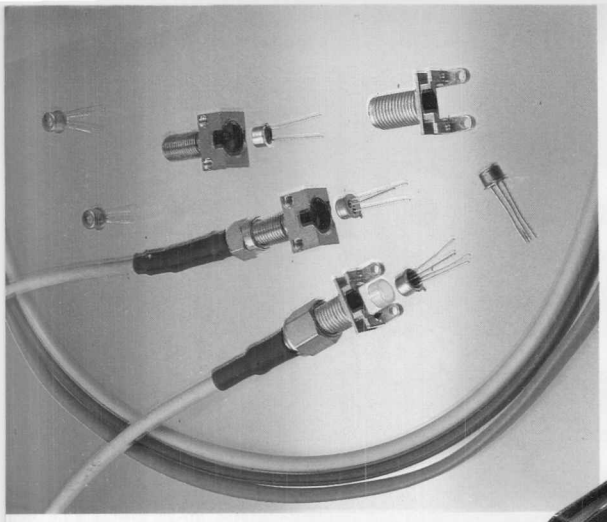

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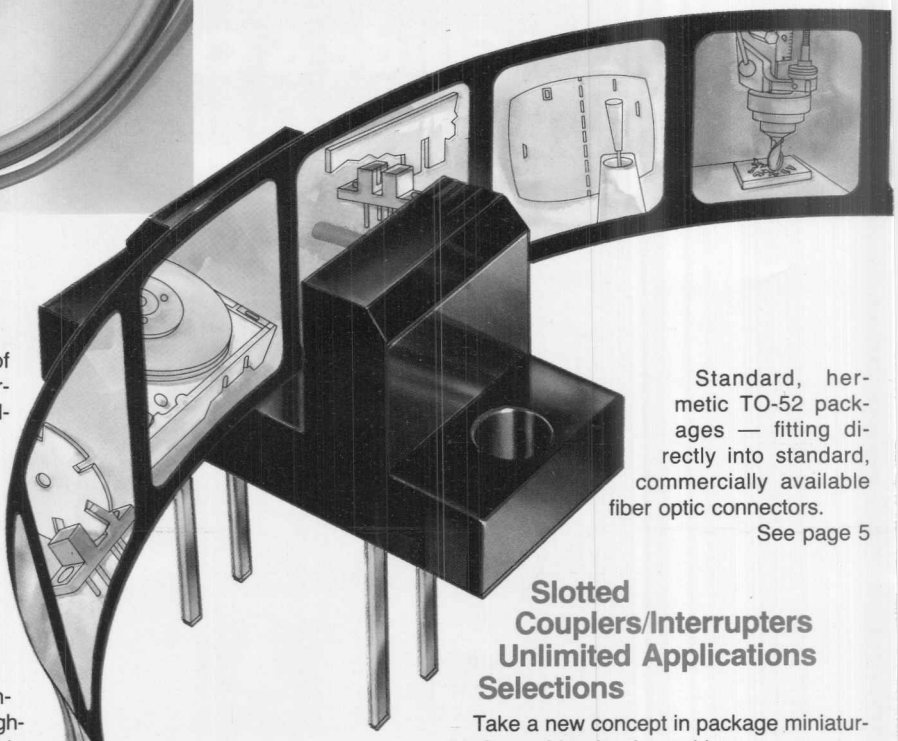


A Breakthrough In Fiber Optics Emitters

With an inherent bandwidth of 100 MHz, Motorola's newest surface-emitting infrared emitters advance the state of the art by a factor of at least 2 — competing directly with laser and edge-emitting devices costing several times as much. Combined in these IREDs are:

Spectral response that peaks at 820 nm — an ideal match for the propagation characteristics of most fiber optics cable.

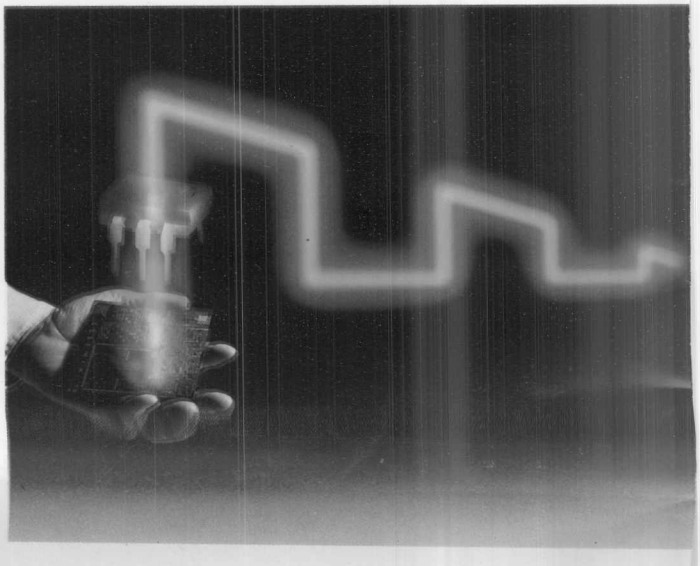
Low cost — bringing the advantages of light communications to high-volume applications, such as data transmission, CATV/FM, and communications multiplexing.

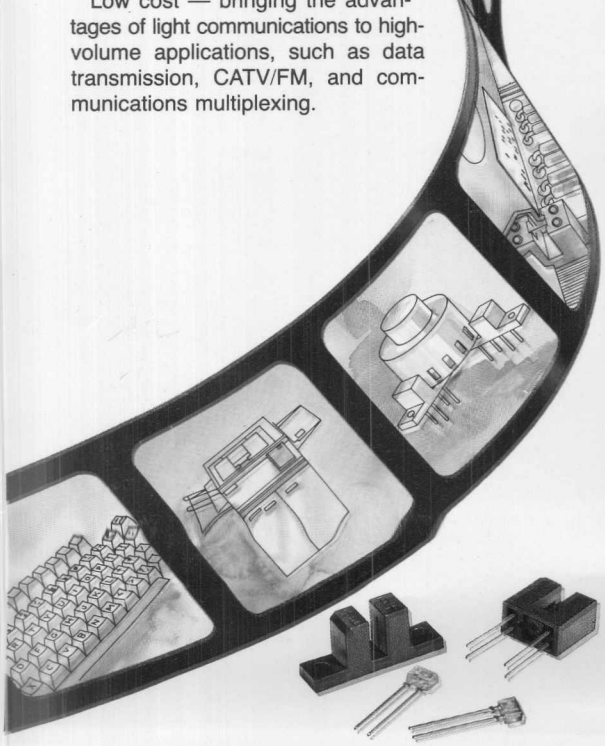
Standard, hermetic TO-52 packages — fitting directly into standard, commercially available fiber optic connectors.

See page 5

Slotted Couplers/Interrupters Unlimited Applications Selections

Take a new concept in package miniaturization, add to it a lensed beam concentrator, back it up with the industry's largest va-





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Highlights

riety of optoelectronic device functions, and you find a capability to meet whatever demands a particular application may make. Motorola's new, low-profile, lensed, Case 349 plastic package, coupled with package-compatible standard chips including infrared emitters and detectors (transistors, Darlingtons, PIN diodes, SCR's, Schmitt triggers, triac drivers, etc.) permits a wide variety of emitter/detector combinations. This is evidenced by an extensive line of standard slotted coupler functions already on the market, with well formed plans for line extensions in the implementation stage.

See page 12

Digital Optics . . . Via Schmitt Triggers

Sensitive enough to be compatible with standard logic circuits, Motorola's new Schmitt trigger optocouplers provide precision switching and code transmission by means of light. Wave shaping, A-D conversion, accurate long-line data transmission and control — all with high optical isolation, noise-free, trouble-free operation.

See page 10

Optoelectronics Selector Guide & Cross Reference

The Motorola Optoelectronics product line consists of gallium-arsenide infrared-emitting diodes, silicon photodetectors, high-technology optocoupler/isolators, slotted couplers and fiber optic emitters and detectors.

This Selector Guide and Cross Reference contains summary specifications for each device in the Motorola optoelectronics product line.

All devices listed are available direct from Motorola and from Motorola's authorized distributors. Applications assistance and information on pricing and delivery are available from your nearest Motorola sales office.

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Alphanumeric Listing

This listing includes all devices in Motorola's Optoelectronics line. CTR, Current Transfer Ratio, is listed for each transistor and Darlington optocoupler to simplify locating a specific device in the Selector Guide where they are listed in order of ascending CTR.

Device	CTR %	Page
Optocoupler, Transistor		
4N25	20	7
4N25A	20	7
4N26	20	7
4N27	10	7
4N28	10	7
Optocoupler, Darlington		
4N29	100	8
4N29A	100	8
4N30	100	8
4N31	50	8
4N32	500	8
4N32A	500	8
4N33	500	8
Optocoupler, Transistor		
4N35	100	7
4N36	100	7
4N37	100	7
Optocoupler, High Voltage Transistor		
4N38		7
4N38A		7
Optocoupler, SCR		
4N39		9
Optocoupler, Transistor		
CNY17-1	40	7
CNY17-2	63	7
CNY17-3	100	7
CNY17-4	160	7
H11A1	50	7
H11A2	20	7
H11A3	20	7
H11A4	10	7
H11A5	30	7
H11A520	20	7
H11A550	50	7
H11A5100	100	7
Optocoupler, AC Input, Transistor		
H11AA1		10
H11AA2		10
Optocoupler, Darlington		
H11B1	500	8
H11B2	200	8
H11B3	100	8
H11B255	100	8
Optocoupler, SCR		
H11C1		9
H11C2		9
H11C3		9
Optocoupler, High Voltage Transistor		
H11D1		8
H11D2		8
H11D3		8
H11D4		8
Optocoupler, Resistor Darlington		
H11G1		8
H11G2		8
H11G3		8
Optocoupler, Triac Driver		
H11J1		9
H11J2		9
H11J3		9
H11J4		9
H11J5		9
Optocoupler, Schmitt Trigger		
H11L1		10
H11L2		10

Device	CTR %	Page
Optocoupler, SCR		
H74C1		9
Optocoupler, Transistor		
IL1	20	7
IL12	10	7
IL74	12.5	7
Optocoupler, Darlington		
MCA230	100	8
MCA231	200	8
MCA255	100	8
Optocoupler, SCR		
MCS2		10
Optocoupler, Transistor		
MCT2	20	7
MCT2E	20	7
MCT26	6	7
MCT271	45	7
MCT272	75	7
MCT273	125	7
MCT274	225	7
MCT275	70	7
MCT277	40	7
MCT2200	20	7
MCT2201	100	7
Fiber Optics, Detector		
MFOD71		13
MFOD72		13
MFOD73		13
MFOD100		13
MFOD200		13
MFOD300		13
MFOD1100		13
MFOD2202		13
MFOD2302		13
MFOD2404		13
MFOD2405		13
Fiber Optics, Emitter		
MFOE71		12
MFOE200		12
MFOE1200		12
MFOE1201		12
MFOE1202		12
IRED		
MLED15		5
MLED71		5
MLED910		5
MLED930		5
Optocoupler, Darlington, No Base Connection		
MOC119		8
Optocoupler, VDE Transistor		
MOC601A		11
MOC602A		11
MOC603A		11
MOC604A		11
Optocoupler, VDE Darlington		
MOC622A		11
MOC623A		11
MOC624A		11
MOC625A		11
Optocoupler, VDE Darlington, No Base Connection		
MOC626A		11
MOC627A		11
MOC628A		11
MOC629A		11
Optocoupler, VDE Triac Driver		
MOC633A		11
MOC634A		11
MOC635A		11

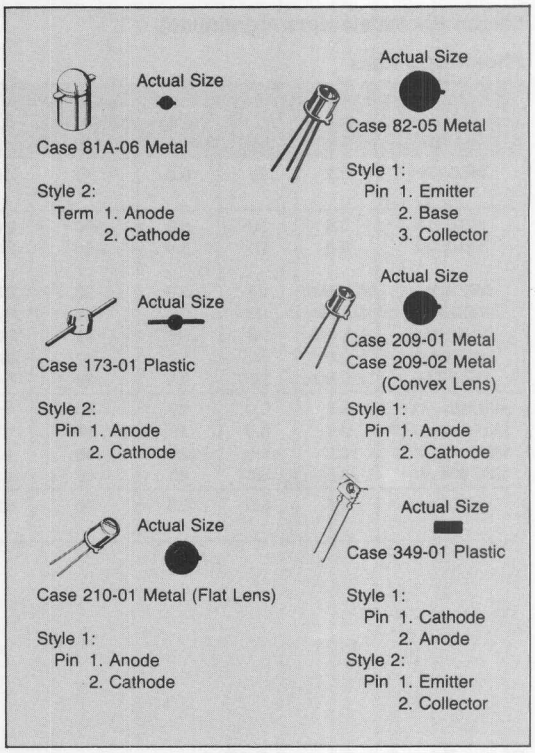
Device	CTR %	Page
Optocoupler, VDE Triac Driver		
MOC640A		11
MOC641A		11
Optocoupler, Transistor		
MOC1005	20	7
MOC1006	10	7
Optocoupler, SCR		
MOC3002		9
MOC3003		9
MOC3007		9
Optocoupler, Triac Driver		
MOC3009		9
MOC3010		9
MOC3011		9
MOC3012		9
MOC3020		9
MOC3021		9
MOC3022		9
MOC3023		9
MOC3030		9
MOC3031		9
MOC3032		9
MOC3040		9
MOC3041		9
Optocoupler, Schmitt Trigger		
MOC5007		10
MOC5008		10
MOC5009		10
Optocoupler, AC Linear Amp.		
MOC5010		10
Slotted Coupler, Transistor		
MOC7811		12
MOC7812		12
MOC7813		12
MOC7821		12
MOC7822		12
MOC7823		12
Optocoupler, Darlington, No Base Connection		
MOC8020	500	8
MOC8021	1000	8
MOC8030	300	8
MOC8050	500	8
Optocoupler, Transistor		
MOC8100	50	7
Optocoupler, Transistor, No Base Connection		
MOC8111		8
MOC8112		8
MOC8113		8
Optocoupler, High Voltage Transistor		
MOC8204		8
MOC8205		8
MOC8206		8
Detector, Transistor		
MRD150		6
MRD300		6
MRD310		6
Detector, Darlington		
MRD360		5
MRD370		5
Detector, PIN		
MRD500		5
MRD510		5

Device	CTR %	Page
Detector, Transistor		
MRD601		6
MRD602		6
MRD603		6
MRD604		6
MRD611		6
MRD612		6
MRD613		6
MRD614		6
MRD701		6
Detector, Resistor Darlington		
MRD711		5
Detector, PIN		
MRD721		5
Detector, Schmitt Trigger		
MRD750		6
Detector, Triac Driver		
MRD730		6
MRD740		6
MRD3010		6
MRD3011		6
Detector, Transistor		
MRD3050		6
MRD3051		6
MRD3054		6
MRD3055		6
MRD3056		6
Optocoupler, Transistor		
TIL111	8	7
TIL112	2	7
Optocoupler, Darlington		
TIL113	300	8
Optocoupler, Transistor		
TIL114	8	7
TIL115	2	7
TIL116	20	7
TIL117	50	7
Optocoupler, Transistor, No Base Connection		
TIL118		8
Optocoupler, Darlington, No Base Connection		
TIL119		8
Optocoupler, Transistor		
TIL124	10	7
TIL125	20	7
TIL126	50	7
Optocoupler, Darlington		
TIL127	300	8
Optocoupler, Darlington, No Base Connection		
TIL128		8
Optocoupler, Transistor		
TIL153	10	7
TIL154	20	7
TIL155	50	7
Optocoupler, Darlington		
TIL156	300	8
Optocoupler, Darlington, No Base Connection		
TIL157		8

Infrared Emitting Diodes

Motorola's infrared emitting diodes are made by the liquid phase epitaxial process for long life and stability. They provide high power output and quick response at 930 nm with low input drive current.

Device	Power Output μW @ I_F mA Typ		Emission Angle Typ	Peak Emission Wavelength nm Typ	Forward Voltage @ I_F mA Max		Case
MLED15	1300	30	145°	930	1.5	30	173-01 Style 2
MLED71	2500	50	60°	940	1.8	50	349-01 Style 1
MLED910	150	50	30°	900	1.5	50	81A-06 Style 2
MLED930	650	100	30°	900	1.5	50	209-01 Style 1



Silicon Photodetectors

A variety of silicon photodetectors are available, varying from simple PIN diodes to complex, single chip 400 volt triac drivers. They are available in packages offering choices of viewing angle and size in either economical plastic cases or rugged, hermetic metal cans. They are spectrally matched for use with Motorola infrared emitting diodes.

Photodiodes

Device	Light Current μA @ V_R Volts	H mW/cm²	$V_{(BR)R}$ Volts Min	Dark Current nA Max @ Volts	Response Time ns Typ	Case
MRD500	9.0 @ 20	5.0	100	2.0 @ 20	1.0	209-02 Convex Lens
MRD510	2.0 @ 20	5.0	100	2.0 @ 20	1.0	210-01 Flat Lens
MRD721	4.0 @ 20	5.0	100	10 @ 20	1.0	349-01 Style 1

Photodarlingtons

Device	Light Current mA Typ @ V_{CC}	H mW/cm²	$V_{(BR)CEO}$ Volts Min	t_r, t_f/t_{on}, t_{off}* μs @ Typ V_{CC}	I_L μA	Case
MRD370	10 @ 5.0	0.5	40	15/40 @ 5.0	1.0	82-05
MRD360	20 @ 5.0	0.5	40	15/65 @ 5.0	1.0	Style 1
MRD711(1)	25 @ 5.0	0.5	60	125/150* @ 5.0*		349-01 Style 2

(1) Photodarlington with integral base-emitter resistor.

OPTOELECTRONICS — EMITTERS/DETECTORS (continued)

Silicon Photodetectors (continued)

Phototransistors

Device	Light Current mA Typ @ V_{CC}		H mW/cm²	$V_{(BR)CEO}$ Volts Min	t_r, t_f/t_{on}, t_{off}* μs Typ @ V_{CC}		I_L μA	Case
MRD150	2.2	20	5.0	40	2.5/4.0	20	1000	173-01 Style 1
MRD310	3.5	20	5.0	50	2.0/2.5	20	1000	82-05
MRD300	8.0	20	5.0	50	2.0/2.5	20	1000	Style 1
MRD3050	0.1 Min	20	5.0	30	2.0/2.5	20	1000	
MRD3051	0.2 Min	20	5.0	30	2.0/2.5	20	1000	
MRD3054	0.5 Min	20	5.0	30	2.0/2.5	20	1000	
MRD3055	1.5 Min	20	5.0	30	2.0/2.5	20	1000	
MRD3056	2.0 Min	20	5.0	30	2.0/2.5	20	1000	
MRD601, 611*	1.5	5.0	20	50	1.5/15	30	800	81A-06*
MRD602, 612*	3.5	5.0	20	50	1.5/15	30	800	Style 1
MRD603, 613*	6.0	5.0	20	50	1.5/15	30	800	81A-07
MRD604, 614*	8.5	5.0	20	50	1.5/15	30	800	Style 1
MRD701	0.5	5.0	0.5	30	10/60*	5.0*		349-01 Style 2

Photo Triac Drivers and SCRs*

Device	Latching Irradiance Level H_{FT} mW/cm² Max	On-State RMS Current mA Max	Off-State Output Terminal Voltage Volts Peak Min	Peak Blocking Current nA Typ	Case
MRD730	50	—	400	5.0	349C-01 Style 4
MRD740*	5.0	125	200	—	Style 5*
MRD3010	5.0	100	250	10	82-05
MRD3011	2.0	100	250	10	Style 3

Photo Schmitt Trigger

Device	Threshold Current mA ON Max	Threshold Current mA OFF Min	$I_{F(off)}$ / $I_{F(on)}$ Typ	V_{CC} Volts	t_r, t_f μs Typ	Case
MRD750	20	1.0	0.75	3–15	0.1	349C-01 Style 3

Actual Size

Case 81A-06 Metal (Flat Lens)
Case 81A-07 Metal

Style 1:
Term 1. Emitter
2. Collector

Actual Size

Case 82-05 Metal

Style 1:
Pin 1. Emitter
2. Base
3. Collector

Style 3:
Pin 1. Main Substrate
2. Main Substrate
3. Substrate
(do not connect)

Actual Size

Case 173-01 Plastic

Style 2:
Pin 1. Anode
2. Cathode

Actual Size

Case 349-01 Plastic

Style 2:
Pin 1. Emitter
2. Collector

Actual Size

Case 349C-01 Plastic

Style 3:
Pin 1. Output
2. Ground
3. V_{CC}

Style 4:
Pin 1. Main Term #1
2. Substrate
(do not connect)
3. Main Term #2

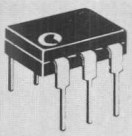
Style 5:
Pin 1. Gate
2. Anode
3. Cathode

Optoelectronics — Couplers/Isolators

Optocoupler/Isolators

An optocoupler consists of a gallium arsenide infrared emitting diode, IRED, optically coupled to a monolithic silicon photodetector/output device in a light-shielding package. Motorola offers a wide array of standard devices in the popular 6-pin DIP package and encourages the use of special designs and selections for special applications. All Motorola optocouplers are UL Recognized per File Number 54915.

Style 1:
Pin 1. Anode
2. Cathode
3. NC
4. Emitter
5. Collector
6. Base



CASE 730A-01

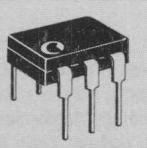
Transistor Output — Style 1

Device	Current Transfer Ratio (CTR)			V_{ISO} Volts ac Peak		$V_{CE(sat)}$			t_r, t_f/t_{on}, t_{off}* Typ					$V_{(BR)CEO}$ Volts	V_F	
	% Min	@ I_F mA	V_{CE} Volts	Industry	Motorola	Volts Max	@ I_F mA	I_C mA	μs	@ I_C mA	V_{CC} Volts	R_L Ω	I_F mA	Min	Volts Max	@ I_F mA
TIL112	2.0	10	5.0	1500	7500	0.5	50	2.0	2.0	2.0	10	100		20	1.5	10
TIL115	2.0	10	5.0	2500	7500	0.5	50	2.0	2.0	2.0	10	100		20	1.5	10
MCT26	6.0	10	10	2500(R)	7500	0.3	20	0.25	2.0	2.0	10			30	1.5	20
TIL111	8.0	16	0.4	1500	7500	0.4	16	2.0	5.0	2.0	10	100		30	1.4	16
TIL114	8.0	16	0.4	2500	7500	0.4	16	2.0	5.0	2.0	10	100		30	1.4	16
4N27	10	10	10	1500	7500	0.5	50	2.0	2.0/8.0	10	10			30	1.5	10
4N28	10	10	10	500	7500	0.5	50	2.0	2.0/8.0	10	10			30	1.5	10
4N38,A	10	10	10	2500	7500	1.0	20	4.0	0.8/7.0	10	10			80	1.5	10
H11A4	10	10	10	1500	7500	0.4	10	0.5	2.0	2.0	10	100		30	1.5	10
IL-12	10	10	5.0	1000(D)	7500	0.5	50	2.0	2.0		10		10	20	1.5	10
MOC1006	10	10	10		7500	0.5	50	2.0	2.0/8.0	10	10			30	1.5	10
TIL124	10	10	10	5000	7500	0.4	10	1.0	2.0	2.0	10	100		30	1.4	10
TIL153	10	10	10	3540	7500	0.4	10	1.0	2.0	2.0	10	100		30	1.4	10
IL-74	12.5	16	5.0	1500(D)	7500	0.5	16	2.0	6.0*/25*		5.0*	2.4k*	16*	20	1.3	100
4N25,A	20	10	10	2500	7500	0.5	50	2.0	0.8/8.0	10	10			30	1.5	10
4N26	20	10	10	1500	7500	0.5	50	2.0	0.8/8.0	10	10			30	1.5	10
H11A2	20	10	10	1500	7500	0.4	10	0.5	2.0	2.0	10	100		30	1.5	10
H11A3	20	10	10	2500	7500	0.4	10	0.5	2.0	2.0	10	100		30	1.5	10
H11A520	20	10	10	5656	7500	0.4	20	2.0	5.0*	2.0*	10*	100*		30	1.5	10
IL-1	20	10	10	2500(D)	7500	0.5	16	1.6	6.0*/25*		5.0*	2.4k*	16*	30	1.5	60
MCT2	20	10	10	2500(R)	7500	0.4	16	2.0	10*/30*		5.0*	2.0k*	15*	30	1.5	20
MCT2E	20	10	10	3000(R)	7500	0.4	16	2.0	2.6	2.0	10	100		30	1.5	20
MCT2200	20	10	5.0	7500	7500	0.4	10	2.5	6.0*/5.5*	2.0*	10*	100*		30	1.5	60
MOC1005	20	10	10		7500	0.5	50	2.0	0.8/8.0	10	10			30	1.5	10
TIL116	20	10	10	2500	7500	0.4	15	2.2	5.0	2.0	10	100		30	1.5	60
TIL125	20	10	10	5000	7500	0.4	10	1.0	2.0	2.0	10	100		30	1.4	10
TIL154	20	10	10	3540	7500	0.4	10	1.0	2.0	2.0	10	100		30	1.4	10
H11A5	30	10	10	1500	7500	0.4	10	0.5	2.0	2.0	10	100		30	1.7	10
MCT277	40	16	0.4	3000(R)	7500				15*	2.0*	5.0*	100*		30	1.5	20
CNY17-1	40–80	10	5.0	7500	7500	0.4	10	2.5	5.6*/4.1*		5.0*	75*	10*	70	1.65	60
MCT271	45–90	10	10	3000(R)	7500	0.4	16	2.0	4.9*/4.5*	2.0*	5.0*	100*		30	1.5	20
MOC8100	50	1.0	5.0		7500	0.5	1.0	0.1	20*	2.0*	10*	100*		30	1.4	1.0
H11A1	50	10	10	2500	7500	0.4	10	0.5	2.0	2.0	10	100		30	1.5	10
H11A550	50	10	10	5656	7500	0.4	20	2.0	5.0*	2.0*	10*	100		30	1.5	10
TIL117	50	10	10	2500	7500	0.4	10	0.5	5.0	2.0	10	100		30	1.4	16
TIL126	50	10	10	5000	7500	0.4	10	1.0	2.0	2.0	10	100		30	1.4	10
TIL155	50	10	10	3540	7500	0.4	10	1.0	2.0	2.0	10	100		30	1.4	10
CNY17-2	63–125	10	5.0	5000	7500	0.4	10	2.5	5.6*/4.1*		5.0*	75*	10*	70	1.65	60
MCT275	70–210	10	10	3000(R)	7500	0.4	16	2.0	4.5*/3.5*	2.0*	5.0*	100*		80	1.5	20
MCT272	75–150	10	10	3000(R)	7500	0.4	16	2.0	6.0*/5.5*	2.0*	5.0*	100*		30	1.5	20
4N35	100	10	10	3500	7500	0.3	10	0.5	4.0*	2.0*	10*	100*		30	1.5	10
4N36	100	10	10	2500	7500	0.3	10	0.5	4.0*	2.0*	10*	100*		30	1.5	10
4N37	100	10	10	1500	7500	0.3	10	0.5	4.0*	2.0*	10*	100*		30	1.5	10
H11A5100	100	10	10	5656	7500	0.4	20	2.0	5.0*	2.0*	10*	100*		30	1.5	10
MCT2201	100	10	5.0	7500	7500	0.4	10	2.5	6.0*/5.5*	2.0*	10*	100*		30	1.5	60
CNY17-3	100–200	10	5.0	5000	7500	0.4	10	2.5	5.6*/4.1*		5.0*	75*	10*	70	1.65	60
MCT273	125–250	10	10	3000(R)	7500	0.4	16	2.0	7.6*/6.6*	2.0*	5.0*	100*		30	1.5	20
CNY17-4	160–320	10	5.0	4000	7500	0.4	10	2.5	5.6*/4.1*		5.0*	75*	10*	70	1.65	60
MCT274	225–400	10	10	2500(R)	7500	0.4	16	2.0	9.1*/7.9*	2.0*	5.0*	100*		30	1.5	20

(R) = RMS (D) = DC *t_{on}, t_{off}

OPTOELECTRONICS — COUPLERS/ISOLATORS (continued)

Optocoupler/Isolators (continued)



CASE 730A-01

Style 1:
Pin 1. Anode
2. Cathode
3. NC
4. Emitter
5. Collector
6. Base

Style 3:
Pin 1. Anode
2. Cathode
3. NC
4. Emitter
5. Collector
6. NC

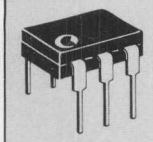
Transistor Output with No Base Connection — Style 3

Device	Current Transfer Ratio (CTR) % Min	@ I_F mA	V_{CE} Volts	V_{ISO} Volts ac Peak Industry	Motorola	$V_{CE(sat)}$ Volts Max	@ I_F mA	I_C mA	t_r, t_f/t_{on}, t_{off}* Typ µs	@ I_C mA	V_{CC} Volts	R_L Ω	I_F mA	$V_{(BR)CEO}$ Volts Min	V_F Volts Max	@ I_F mA
TIL118	10	10	5.0	1500	7500	0.5	50	2.0	2.0	2.0	10	100		20	1.5	10
MOC8111	20	10	10		7500	0.4	10	0.5	20*m	2.0*	10*	100*		30	1.5	10
MOC8112	50	10	10		7500	0.4	10	0.5	20*m	2.0*	10*	100*		30	1.5	10
MOC8113	100	10	10		7500	0.4	10	0.5	20*m	2.0*	10*	100*		30	1.5	10
Darlington Output — Style 1																
4N31	50	10	10	1500	7500	1.2	8.0	2.0	2*/25*	50*	10*		200*	30	1.5	10
4N29,A	100	10	10	2500	7500	1.0	8.0	2.0	2*/25*	50*	10*		200*	30	1.5	10
4N30	100	10	10	1500	7500	1.0	8.0	2.0	2*/25*	50*	10*		200*	30	1.5	10
H11B3	100	1.0	5.0	2500	7500	1.0	1.0	1.0	125*/100*	10*	10*	100*		25	1.5	50
H11B255	100	10	5.0	1500	7500	1.0	50	50	125*/100*	10*	10*	100*		55	1.5	20
MCA230	100	10	5.0	4000(D)	7500	1.0	50	50	10/35		10	100	50	30	1.5	20
MCA255	100	10	5.0	4000(D)	7500	1.0	50	50	10/35		10	100	50	55	1.5	20
H11B2	200	1.0	5.0	2500	7500	1.0	1.0	1.0	125*/100*	10*	10*	100*		25	1.5	10
MCA231	200	1.0	1.0	4000(D)	7500	1.2	10	50	80	10	10	100		30	1.5	20
TIL113	300	10	1.0	1500	7500	1.0	50	125	300	125	15	100		30	1.5	10
TIL127	300	10	1.0	5000	7500	1.0	50	125	300	125	15	100		30	1.5	10
TIL156	300	10	1.0	3535	7500	1.0	50	125	300	125	15	100		30	1.5	10
4N32,A	500	10	10	2500	7500	1.0	8.0	2.0	2*/60*	50*	10*		200*	30	1.5	10
4N33	500	10	10	1500	7500	1.0	8.0	2.0	2*/60*	50*	10*		200*	30	1.5	10
H11B1	500	1.0	5.0	2500	7500	1.0	1.0	1.0	125*/100*	10*	10*	100*		25	1.5	10
Darlington Output with No Base Connection — Style 3																
MOC119	300	10	2.0		7500	1.0	10	10	10/50	2.5	10	100		30	1.5	10
TIL119	300	10	2.0	1500	7500	1.0	10	10	300	2.5	10	100		30	1.5	10
TIL128	300	10	2.0	5000	7500	1.0	10	10	300	2.5	10	100		30	1.5	10
TIL157	300	10	2.0	3535	7500	1.0	10	10	300	2.5	10	100		30	1.5	10
MOC8030	300	10	1.5		7500				13*/60*		50*	100*	10*	80	2.0	10
MOC8020	500	10	5.0		7500				13*/60*		50*	100*	10*	50	2.0	10
MOC8050	500	10	1.5		7500				13*/60*		50*	100*	10*	80	2.0	10
MOC8021	1000	10	5.0		7500				13*/60*		50*	100*	10*	50	2.0	10
Resistor-Darlington Output — Style 1																
H11G1	1000	10	1.0	3535	7500	1.0	1.0	1.0	5.0/100		5.0	100	10	100	1.5	10
H11G2	1000	10	1.0	3535	7500	1.0	1.0	1.0	5.0/100		5.0	100	10	80	1.5	10
H11G3	200	1.0	5.0	2125	7500	1.2	50	20	5.0/100		5.0	100	10	55	1.5	10
High Voltage Transistor Output — Style 1																
MOC8204	20	10	10		7500	0.4	10	0.5	5.0*	2.0*	10*	100*		400	1.5	10
MOC8205	10	10	10		7500	0.4	10	0.5	5.0*	2.0*	10*	100*		400	1.5	10
MOC8206	5.0	10	10		7500	0.4	10	0.5	5.0*	2.0*	10*	100*		400	1.5	10
H11D1	20	10	10	3500	7500	0.4	10	0.5	5.0*	2.0*	10*	100*		300	1.5	10
H11D2	20	10	10	2500	7500	0.4	10	0.5	5.0*	2.0*	10*	100*		300	1.5	10
H11D3	20	10	10	2500	7500	0.4	10	0.5	5.0*	2.0*	10*	100*		200	1.5	10
H11D4	10	10	10	2500	7500	0.4	10	0.5	5.0*	2.0*	10*	100*		200	1.5	10
4N38	10	10	10	1500	7500	1.0	20	4.0	0.8/7.0	10	10			80	1.5	10
4N38A	10	10	10	2500	7500	1.0	20	4.0	0.8/7.0	10	10			80	1.5	10
MCT275	70–210	10	10	3000(R)	7500	0.4	16	2.0	4.5*/3.5*	2.0*	5.0*	100*		80	1.5	20

(R) = RMS (D) = DC *t_{on}, t_{off}

OPTOELECTRONICS — COUPLERS/ISOLATORS (continued)

Optocoupler/Isolators (continued)



CASE 730A-01

Style 6:
Pin 1. Anode
2. Cathode
3. NC
4. Main Terminal
5. Substrate
6. Main Terminal

Style 7:
Pin 1. LED Anode
2. LED Cathode
3. NC
4. SCR Cathode
5. SCR Anode
6. SCR Gate

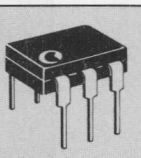
Triac Driver Output — Style 6

Device	Peak Blocking Voltage Min	LED Trigger Current-I_{FT} (V_{TM} = 3.0 V)	Zero Crossing Inhibit Voltage (at rated I_{FT})	Surge Isolation Voltage Vac pk Min		dv/dt
		mA Max	Volts Max	Industry	Motorola	V/μs Typ
H11J1	250	10	—	5656	7500	2.0
H11J2	250	15	—	5656	7500	2.0
H11J3	250	10	—	3535	7500	2.0
H11J4	250	15	—	3535	7500	2.0
H11J5	250	25	—	2120	7500	2.0
MOC3009	250	30	—		7500	2.0
MOC3010	250	15	—		7500	2.0
MOC3011	250	10	—		7500	2.0
MOC3012	250	5.0	—		7500	2.0
MOC3020	400	30	—		7500	10
MOC3021	400	15	—		7500	10
MOC3022	400	10	—		7500	10
MOC3023	400	5.0	—		7500	10
MOC3030	250	30	25		7500	100
MOC3031	250	15	25		7500	100
MOC3032	250	10	25		7500	100
MOC3040	400	30	40		7500	100
MOC3041	400	15	40		7500	100

SCR Output — Style 7

Device	Peak Blocking Voltage	LED Trigger Current-I_{FT} (V_{AK} = 50 V)	Surge Isolation Voltage Vac pk Min		dv/dt
	Min Volts	mA Max	Industry	Motorola	V/μs Typ
4N39	200	30	1500	7500	500 Min
H11C1	200	20	3535	7500	500 Min
H11C2	200	20	2500	7500	500 Min
H11C3	200	30	2500	7500	500 Min
H74C1	200	(TTL drive)	2500	7500	
MCS2	200	14(V_{AK} = 100)	3000 RMS	7500	
MOC3002	250	30		7500	500
MOC3003	250	20		7500	500
MOC3007	200	40		7500	500

Optocoupler/Isolators (continued)



CASE 730A-01

Style 5:
Pin 1. Anode
2. Cathode
3. NC
4. Output
5. Ground
6. V_{CC}

Style 8:
Pin 1. LED 1 Anode/LED 2 Cathode
2. LED 1 Cathode/LED 2 Anode
3. NC
4. Emitter
5. Collector
6. Base

Schmitt Trigger Output — Style 5

Device	Threshold Current ON mA Max	Threshold Current Off mA Min	$I_{F(off)}/I_{F(on)}$ Min	$I_{F(off)}/I_{F(on)}$ Max	V_{CC} Min	V_{CC} Max	t_r, t_f µs Typ	V_{ISO} Vac pk Min Industry	V_{ISO} Vac pk Min Motorola
H11L1	1.6	0.3	0.5	0.9	3.0	15	0.1	3535	7500
H11L2	10	0.3	0.5	0.9	3.0	15	0.1	3535	7500
MOC5007	1.6	0.3	0.5	0.9	3.0	15	0.1		7500
MOC5008	4.0	0.3	0.5	0.9	3.0	15	0.1		7500
MOC5009	10	0.3	0.5	0.9	3.0	15	0.1		7500

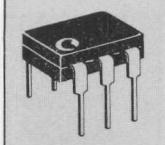
AC Input — Transistor Output — Style 8

Device	Current Transfer Ratio (CTR) % Min	@ I_F mA	V_{CE} Volts	V_{ISO} Volts ac Peak Industry	V_{ISO} Volts ac Peak Motorola	$V_{CE(sat)}$ Volts Max	@ I_F mA	I_C mA	$V_{(BR)CEO}$ Volts Min	V_F Volts Max	@ I_F mA
H11AA1	**20**	±10	10	2500	7500	0.4	±10	0.5	30	1.5	±10
H11AA2	**10**	±10	10	2500	7500	0.4	±10	0.5	30	1.5	±10

AC Input — Linear Amplifier Output — Style 5

Device	Transfer Gain (V_{CC} = 12 V) mV/mA Typ	Single Ended Distortion (V_{CC} = 12 V) (I_{sig} = 1.0 mA) % Typ	V_{ISO} Vac pk Min
MOC5010	200	0.2	7500

Optocoupler/Isolators (continued)



CASE 730A-01

Style 1:
Pin 1. Anode
2. Cathode
3. NC
4. Emitter
5. Collector
6. Base

Style 3:
Pin 1. Anode
2. Cathode
3. NC
4. Emitter
5. Collector
6. NC

Style 6:
Pin 1. Anode
2. Cathode
3. NC
4. Main Terminal
5. Substrate
6. Main Terminal

VDE Approved Optocouplers

Transistor Output — Style 1

Device	Current Transfer Ratio (CTR) % Min	@ I_F mA	V_{CE} Volts	V_{ISO} Volts ac Peak	$V_{CE(sat)}$ Volts Max	@ I_F mA	I_C mA	t_r, t_f/t_{on}, t_{off}* Typ µs	@ I_C mA	V_{CC} Volts	R_L Ω	$V_{(BR)CEO}$ Volts Min	V_F Volts Max	@ I_F mA
MOC601A	10	10	10	7500	0.5	50	2.0	8.0*	2.0*	10*	100*	30	1.5	10
MOC602A	20	10	10	7500	0.5	50	2.0	8.0*	2.0*	10*	100*	30	1.5	10
MOC603A	50	10	10	7500	0.5	50	2.0	8.0*	2.0*	10*	100*	30	1.5	10
MOC604A	100	10	10	7500	0.5	50	2.0	8.0*	2.0*	10*	100*	30	1.5	10

Darlington Output — Style 1

Device	Current Transfer Ratio (CTR) % Min	@ I_F mA	V_{CE} Volts	V_{ISO} Volts ac Peak	$V_{CE(sat)}$ Volts Max	@ I_F mA	I_C mA	t_r, t_f/t_{on}, t_{off}* Typ µs	@ I_C mA	V_{CC} Volts	R_L Ω	I_F mA	$V_{(BR)CEO}$ Volts Min	V_F Volts Max	@ I_F mA
MOC622A	100	10	10	7500	1.0	8.0	2.0	15*/60*	50*	10*	100*	200*	30	1.5	10
MOC623A	300	10	10	7500	1.0	8.0	2.0	15*/60*	50*	10*	100*	200*	30	1.5	10
MOC624A	500	10	10	7500	1.0	8.0	2.0	15*/60*	50*	10*	100*	200*	30	1.5	10
MOC625A	1000	10	10	7500	1.0	8.0	2.0	15*/60*	50*	10*	100*	200*	30	1.5	10

Darlington Output with No Base Connection — Style 3

Device	Current Transfer Ratio (CTR) % Min	@ I_F mA	V_{CE} Volts	V_{ISO} Volts ac Peak	$V_{CE(sat)}$ Volts Max	@ I_F mA	I_C mA	t_r, t_f/t_{on}, t_{off}* Typ µs	@ I_C mA	V_{CC} Volts	R_L Ω	I_F mA	$V_{(BR)CEO}$ Volts Min	V_F Volts Max	@ I_F mA
MOC626A	100	10	10	7500	1.0	8.0	2.0	15*/60*	50*	10*	100*	200*	30	1.5	10
MOC627A	300	10	10	7500	1.0	8.0	2.0	15*/60*	50*	10*	100*	200*	30	1.5	10
MOC628A	500	10	10	7500	1.0	8.0	2.0	15*/60*	50*	10*	100*	200*	30	1.5	10
MOC629A	1000	10	10	7500	1.0	8.0	2.0	15*/60*	50*	10*	100*	200*	30	1.5	10

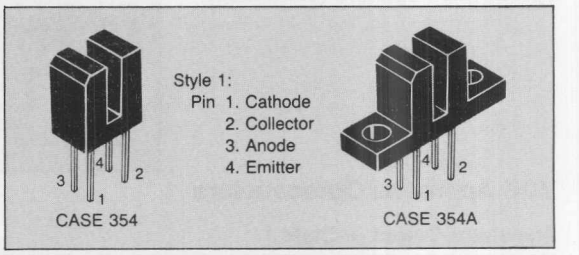
Triac Driver Output — Style 6

Device	Peak Blocking Voltage Min	LED Trigger Current, I_{FT} (V_{TM} = 3.0 V) mA Max	Zero Crossing Inhibit Voltage (at rated I_{FT}) Volts Max	Surge Isolation Voltage Vac pk Min	dv/dt V/µs Typ
MOC633A	400	30	—	7500	10
MOC634A	400	15	—	7500	10
MOC635A	400	10	—	7500	10
MOC640A	400	30	40	7500	1000
MOC641A	400	15	40	7500	1000

Optoelectronics — Couplers/Interrupters

Slotted Couplers/Interrupter Modules

Slotted couplers consist of an infrared emitting diode facing a photodetector in a molded plastic housing. A slot in the housing between the emitter and the detector provides a means of interrupting the signal. A wide selection of standard and custom housings and detector functions is available. All IREDs and photodetectors in the miniature Case 349 (see Silicon Photodetectors) can be used in these housings.



Transistor Output ($V_{(BR)CEO}$ = 30 V)

Device	Current Transfer Ratio (CTR) % Min	@ I_F mA	V_{CE} Volts	$V_{CE(sat)}$ Volts Max	@ I_F mA	I_C mA	t_{on}, t_{off}* Typ μs	V_{CC} Volts	R_L Ω	I_F mA	V_F Volts Max	@ I_F mA	Case
MOC7811	5.0	20	5.0	0.4	30	1.8	12/60	5.0	2.5K	30	1.8	50	354A
MOC7812	10	20	5.0	0.4	20	1.8	12/60	5.0	2.5K	30	1.8	50	Style 1
MOC7813	20	20	5.0	0.4	20	1.8	12/60	5.0	2.5K	30	1.8	50	
MOC7821	5.0	20	5.0	0.4	30	1.8	12/60	5.0	2.5K	30	1.8	50	354
MOC7822	10	20	5.0	0.4	20	1.8	12/60	5.0	2.5K	30	1.8	50	Style 1
MOC7823	20	20	5.0	0.4	20	1.8	12/60	5.0	2.5K	30	1.8	50	

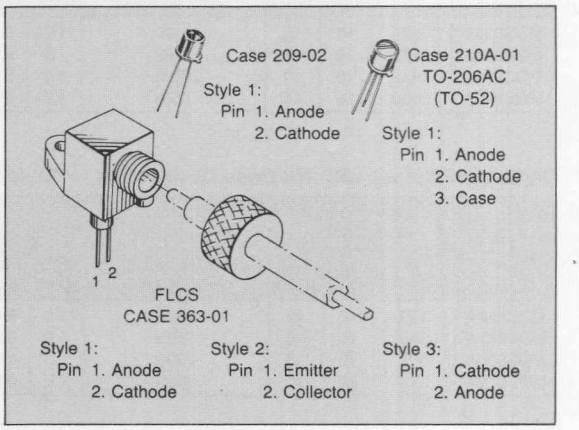
Optoelectronics — Fiber Optic Components

Fiber Optic Devices

Motorola offers high performance Infrared Emitters and Detectors for fiber optic systems. Devices are available for systems requiring greater than 100 MHz analog bandwidth over several kilometers or requiring very low cost with up to 10 MHz bandwidth over short distances.

The packages fit directly into standard fiber optic connector systems. All devices are spectrally matched to minimum attenuation regions of most fiber optic cables.

The Fiber Optic Low Cost System (FLCS) package houses infrared emitters and detectors and has a molded lens which efficiently couples the light to and from the cable. The package is complete with the fiber alignment and locking mechanism and the means for attaching to a board.

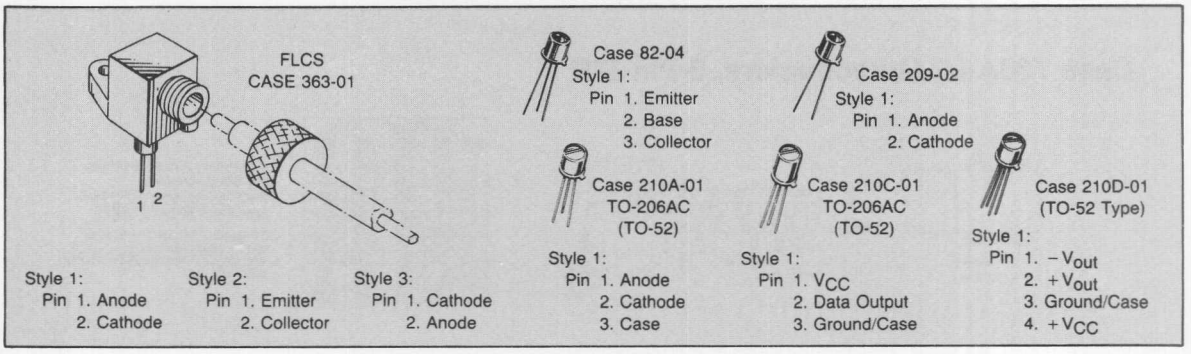


Infrared Emitters

Designed as infrared sources for fiber optic systems. MFOE200 is compatible with AMP #227015; MFOE1200, MFOE1201 and MFOE1202 are compatible with AMP #228756-1 and Amphenol #905-138-5001 receptacles.

Device	Total Power Output mW Typ	@ I_F mA	t_{on}/t_{off} ns Typ	λ nm Typ	Case
MFOE71	3.5	100	25	820	363-01 Style 1 (FLCS)
MFOE200	3.0	100	250	940	209-02 Style 1
MFOE1200	0.9	100	(>70 MHz bw)	820	210A-01 Style 1
MFOE1201	1.5	100	(>100 MHz bw)	820	
MFOE1202	2.4	100	(>100 MHz bw)	820	

Fiber Optic Devices (continued)



Photodetectors

Designed for detection of infrared radiation in fiber optic systems and provide a variety of output configurations. The MFOD100/200/300 are compatible with AMP connector #227015. The MFOD1100 thru 2405 are compatible with AMP #228756-1 and Amphenal #905-138-5001 receptacles.

Device	Responsivity μA/μW Typ	@ λ nm	Response Time μs Typ t_{on}* t_r	t_{off}* t_f	$V_{(BR)}$ Volts Min	Case
Photo PIN Diodes						
MFOD71	0.2	820	1.0* ns	1.0* ns	100	363-01 Style 3 (FLCS)
MFOD100	0.05	900	1.0* ns	1.0* ns	100	209-02 Style 1
MFOD1100	0.4	820	0.5 ns	0.5 ns	50	210A-01 Style 1
Phototransistors						
MFOD72	160	820	10*	60*	30	363-01 Style 2 (FLCS)
MFOD200	18	900	2.5	4.0	30	82-04 Style 1
MFOD2202	110	820	2.5	4.0	40	210C-01 Style 1
Photodarlington						
MFOD73	10,000	820	125*	150*	60	363-01 Style 2 (FLCS)
MFOD300	500	900	40	60	30	82-04 Style 1
MFOD2302	4000	820	40	60	30	210C-01 Style 1
Monolithic IDP	mV/μW				V_{CC} Range	
MFOD2404	35	820	0.035	0.035	4.0–6.0	210D-01 Style 1
MFOD2405	4.5	820	0.010	0.010	4.0–6.0	

Replacements for Discontinued Devices

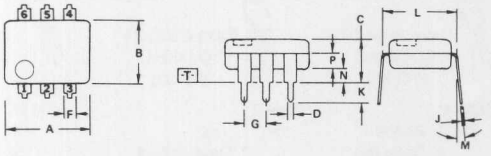
The ferruled plastic fiber optics package is being replaced by the standard, hermetic TO-206AC (TO-52) package. Direct functional replacements for the discontinued devices are shown below.

Discontinued Device	Replacement	Discontinued Device	Replacement
MFOD104F	MFOD1100	MFOD405F	MFOD2405
MFOD110F	MFOD1100	MFOE106F	MFOE1200
MFOD202F	MFOD2202	MFOE107F	MFOE1201
MFOD302F	MFOD2302	MFOE108F	MFOE1202
MFOD404F	MFOD2404		

Package Dimensions and Styles

All optoelectronic packages currently used by Motorola are completely specified for dimension, pinout, and function.

Case 730A-01 Optocouplers, 6-Pin DIP

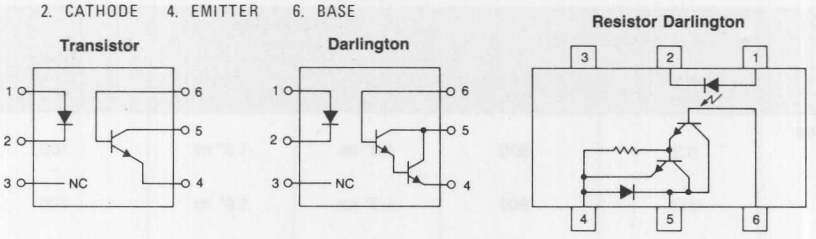


DIM	MILLIMETERS MIN	MAX	INCHES MIN	MAX
A	8.13	8.89	0.320	0.350
B	6.10	6.60	0.240	0.260
C	2.92	5.08	0.115	0.200
D	0.41	0.51	0.016	0.020
F	1.02	1.78	0.040	0.070
G	2.54 BSC		0.100 BSC	
J	0.20	0.30	0.008	0.012
K	2.54	3.81	0.100	0.150
L	7.62 BSC		0.300 BSC	
M	0°	15°	0°	15°
N	0.38	2.54	0.015	0.100
P	1.27	2.03	0.050	0.080

NOTES:
1. DIMENSIONS A AND B ARE DATUMS.
2. -T- IS SEATING PLANE.
3. POSITIONAL TOLERANCES FOR LEADS: ⌖ Ø 0.13 (0.005)Ⓜ T AⓂBⓂ
4. DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
5. DIMENSIONING AND TOLERANCING PER ANSI Y14.5, 1973.

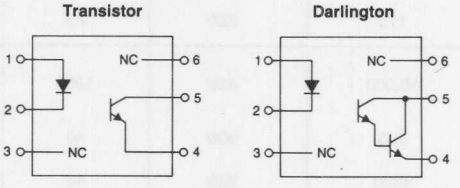
Style 1 Transistors and Darlingtons, Resistor Darlington

PIN 1. ANODE 3. NC 5. COLLECTOR
2. CATHODE 4. EMITTER 6. BASE



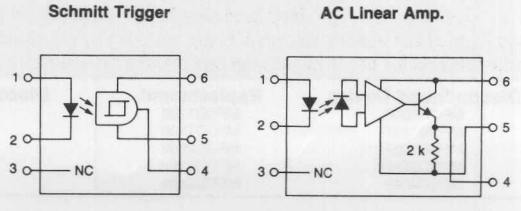
Style 3 Transistors and Darlingtons without Base Connection

PIN 1. ANODE
2. CATHODE
3. NC
4. EMITTER
5. COLLECTOR
6. NC



Style 5

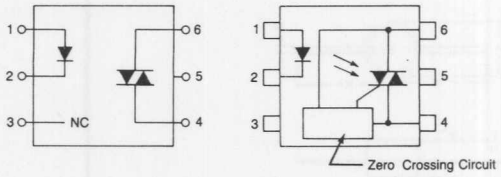
PIN 1. ANODE
2. CATHODE
3. NC
4. OUTPUT
5. GROUND
6. V_{CC}



PACKAGE DIMENSIONS AND STYLES (continued)

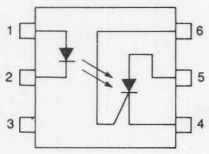
Style 6 Triac Drivers

PIN 1. ANODE
2. CATHODE
3. NC
4. MAIN TERMINAL
5. SUBSTRATE
6. MAIN TERMINAL



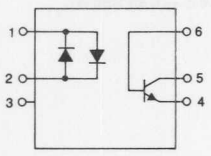
Style 7 SCR

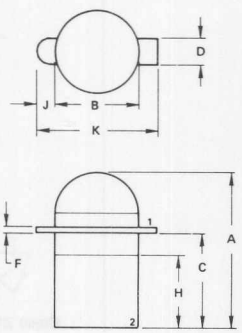
PIN 1. LED ANODE
2. LED CATHODE
3. NC
4. SCR CATHODE
5. SCR ANODE
6. SCR GATE



Style 8 AC Input-Transistor Output

PIN 1. LED 1 ANODE/LED 2 CATHODE
2. LED 1 CATHODE/LED 2 ANODE
3. NC
4. EMITTER
5. COLLECTOR
6. BASE



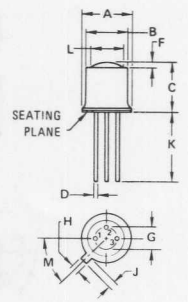


DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	2.59	3.18	0.102	0.125
B	1.47	1.55	0.058	0.061
C	2.08	2.24	0.082	0.088
D	0.41	0.61	0.016	0.024
F	0.13	0.25	0.005	0.010
H	1.60	1.70	0.063	0.067
J	0.23	0.48	0.009	0.019
K	2.13	2.34	0.084	0.092
* A	2.87	3.50	0.113	0.138

STYLE 1:
TERM 1. EMITTER
2. COLLECTOR

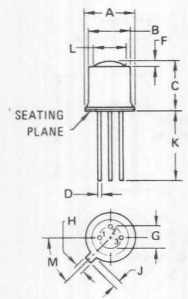
STYLE 2:
TERM 1. ANODE
2. CATHODE

Case 81A-06
***Case 81A-07**



STYLE 1:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

Case 82-04



STYLE 1:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

STYLE 3:
PIN 1. MAIN TERMINAL
2. MAIN TERMINAL
3. SUBSTRATE
(do not connect)

Case 82-05

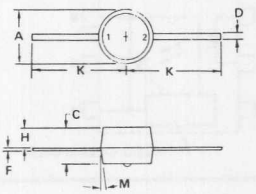
DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	5.31	5.84	0.209	0.230
B	4.52	4.95	0.178	0.195
C	4.57	6.48	0.180	0.255
D	0.41	0.48	0.016	0.019
F	–	1.14	–	0.045
G	2.54 BSC		0.100 BSC	
H	0.99	1.17	0.039	0.046
J	0.84	1.22	0.033	0.048
K	12.70	–	0.500	–
L	3.35	4.01	0.132	0.158
M	45° BSC		45° BSC	

NOTES:
1. LEADS WITHIN .13 mm (.005) RADIUS OF TRUE POSITION AT SEATING PLANE, AT MAXIMUM MATERIAL CONDITION.
2. PIN 3 INTERNALLY CONNECTED TO CASE.

Can dimensions same as TO-206AA (TO-18).

(continued)

PACKAGE DIMENSIONS AND STYLES (continued)



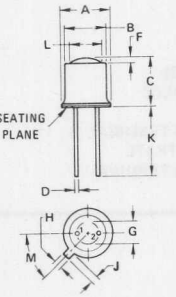
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.98	2.34	0.078	0.092
C	1.22	1.47	0.048	0.058
D	0.25	0.41	0.010	0.016
F	0.10	0.15	0.004	0.006
H	0.51	0.76	0.020	0.030
K	4.06	–	0.160	–
M	3°	7°	3°	7°

STYLE 1:
PIN 1. EMITTER
2. COLLECTOR

STYLE 2:
PIN 1. ANODE
2. CATHODE

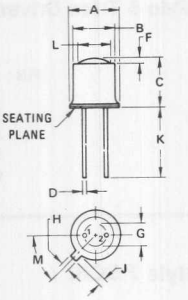
NOTE:
1. INDEX BUTTON ON PACKAGE BOTTOM IS 0.25/0.51 mm (0.010/0.020) DIA & 0.05/0.13 mm (0.002/0.005) OFF SURFACE.

Case 173-01



STYLE 1:
PIN 1. ANODE
PIN 2. CATHODE

Case 209-01



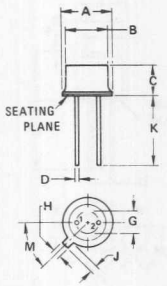
STYLE 1:
PIN 1. ANODE
2. CATHODE

Case 209-02

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.31	5.84	0.209	0.230
B	4.52	4.95	0.178	0.195
C	5.08	6.35	0.200	0.250
D	0.41	0.48	0.016	0.019
F	0.51	1.02	0.020	0.040
G	2.54 BSC		0.100 BSC	
H	0.99	1.17	0.039	0.046
J	0.84	1.22	0.033	0.048
K	12.70	–	0.500	–
L	3.35	4.01	0.132	0.158
M	45° BSC		45° BSC	

NOTES:
1. PIN 2 INTERNALLY CONNECTED TO CASE
2. LEADS WITHIN 0.13 mm (0.005) RADIUS OF TRUE POSITION AT SEATING PLANE AT MAXIMUM MATERIAL CONDITION.

Can dimensions same as TO-206AA (TO-18).

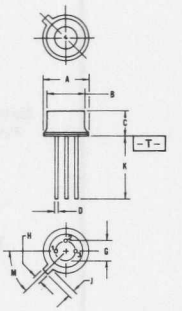


Case 210-01

STYLE 1:
PIN 1. ANODE
2. CATHODE

NOTES:
1. PIN 2 INTERNALLY CONNECTED TO CASE.
2. LEADS WITHIN 0.13 (0.005) RADIUS OF TRUE POSITION AT SEATING PLANE AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.31	5.84	0.209	0.230
B	4.52	4.95	0.178	0.195
C	4.57	5.33	0.180	0.210
D	0.41	0.48	0.016	0.019
G	2.54 BSC		0.100 BSC	
H	0.99	1.17	0.039	0.046
J	0.84	1.22	0.033	0.048
K	12.70	–	0.500	–
M	45° BSC		45° BSC	



Case 210A-01

STYLE 1:
PIN 1. ANODE
2. CATHODE
3. CASE

NOTES:
1. PIN 3 INTERNALLY CONNECTED TO CASE.
2. LEAD POSITIONAL TOLERANCE AT SEATING PLANE:
⌖ ⌀ 0.36 (0.014) Ⓜ T A Ⓜ H Ⓜ
3. DIMENSIONS A AND H ARE DATUMS AND T IS A DATUM PLANE.

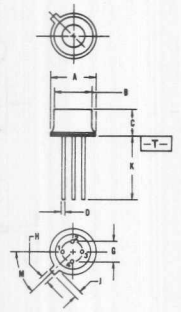
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.31	5.84	0.209	0.230
B	4.65	4.70	0.183	0.185
C	3.12	3.28	0.123	0.129
D	0.41	0.48	0.016	0.019
G	2.54 BSC		0.100 BSC	
H	0.99	1.17	0.039	0.046
J	0.84	1.22	0.033	0.048
K	12.70	–	0.500	–
M	45° BSC		45° BSC	

Case 210C-01

STYLE 1:
PIN 1. V_{CC}
2. DATA OUTPUT
3. GROUND/CASE

NOTES:
1. DIMENSIONS A AND H ARE DATUMS AND T IS A DATUM SURFACE.
2. LEAD POSITIONAL TOLERANCE AT SEATING PLANE:
⌖ ⌀ 0.036 (0.014) Ⓜ T A Ⓜ H Ⓜ
3. DIMENSIONING AND TOLERANCING PER Y14.5, 1973.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.30	5.38	0.209	0.212
B	4.64	4.69	0.183	0.185
C	3.42	3.60	0.135	0.142
D	0.40	0.48	0.016	0.019
G	2.54 BSC		0.100 BSC	
H	0.91	1.16	0.036	0.046
J	0.83	1.21	0.033	0.048
K	12.70	–	0.500	–
M	45° BSC		45° BSC	



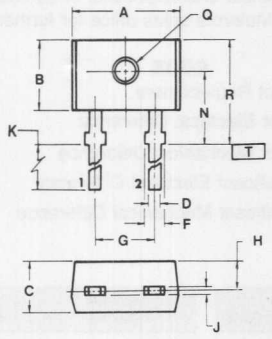
Case 210D-01

STYLE 1:
PIN 1. $-V_{OUT}$
2. $+V_{OUT}$
3. GROUND/CASE
4. $+V_{CC}$

NOTES:
1. DIMENSIONS A AND H ARE DATUMS AND T IS A DATUM SURFACE.
2. LEAD POSITIONAL TOLERANCE AT SEATING PLANE:
⌖ ⌀ 0.036 (0.014) Ⓜ T A Ⓜ H Ⓜ
3. DIMENSIONING AND TOLERANCING PER Y14.5, 1973.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.30	5.38	0.209	0.212
B	4.64	4.69	0.183	0.185
C	3.42	3.60	0.135	0.142
D	0.40	0.48	0.016	0.019
G	2.54 BSC		0.100 BSC	
H	0.91	1.16	0.036	0.046
J	0.83	1.21	0.033	0.048
K	12.70	–	0.500	–
M	45° BSC		45° BSC	

PACKAGE DIMENSIONS AND STYLES (continued)

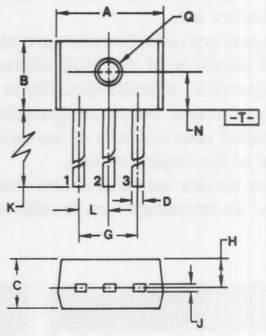


STYLE 1:
PIN 1. CATHODE
2. ANODE
STYLE 2:
PIN 1. EMITTER
2. COLLECTOR

DIM	MILLIMETERS MIN	MAX	INCHES MIN	MAX
A	3.43	4.60	0.135	0.185
B	2.79	3.30	0.110	0.130
C	2.03	3.18	0.080	0.125
D	0.43	0.60	0.017	0.024
F	1.14	1.40	0.045	0.055
G	2.54 BSC		0.100 BSC	
H	1.52 BSC		0.060 BSC	
J	0.23	0.56	0.009	0.022
K	12.83	19.05	0.505	0.750
N	3.05	3.30	0.120	0.130
Q	0.76	1.52	0.030	0.060
R	3.81	4.60	0.150	0.185

NOTES:
1. DIMENSIONS A, B AND C ARE DATUMS.
2. POSITIONAL TOLERANCE FOR D DIMENSION: ⌖ .25 (0.010) Ⓜ T A Ⓜ C Ⓜ
3. POSITIONAL TOLERANCE FOR Q DIAMETER: ⌖ ⌀.25 (0.010) Ⓜ A Ⓜ B Ⓜ
4. ⏥ IS SEATING PLANE.
5. DIMENSIONING AND TOLERANCING PER ANSI Y14.5, 1973.

Case 349-01

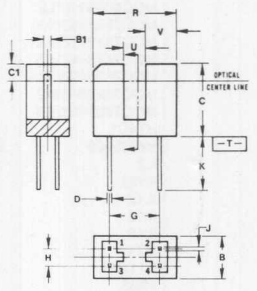


STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
STYLE 2:
PIN 1. EMITTER
2. COLLECTOR
3. BASE

DIM	MILLIMETERS MIN	MAX	INCHES MIN	MAX
A	3.43	4.60	0.135	0.185
B	2.79	3.30	0.110	0.130
C	2.03	3.18	0.080	0.125
D	0.43	0.56	0.017	0.022
G	2.54 BSC		0.100 BSC	
H	1.52 BSC		0.060 BSC	
J	0.23	0.56	0.009	0.022
K	12.70	–	0.500	–
L	1.27 BSC		0.050 BSC	
N	1.78 BSC		0.070 BSC	
Q	0.76	1.52	0.030	0.060

NOTES:
1. DIMENSIONS A, B AND C ARE DATUMS.
2. POSITIONAL TOLERANCE FOR D DIMENSION: ⌖ ⌀ 0.25 (0.010) Ⓜ T A Ⓜ C Ⓜ
3. POSITIONAL TOLERANCE FOR Q DIAMETER: ⌖ ⌀ 0.25 (0.010) Ⓜ A Ⓜ C Ⓜ
4. -T- IS A SEATING PLANE.
5. DIMENSIONING AND TOLERANCING PER ANSI 14.5, 1973.

Case 349C-01

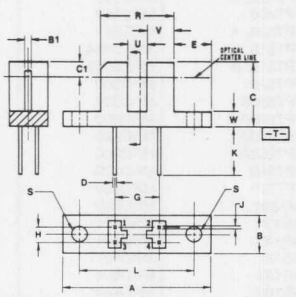


STYLE 1:
PIN 1. CATHODE
2. COLLECTOR
3. ANODE
4. EMITTER

DIM	MILLIMETERS MIN	MAX	INCHES MIN	MAX
B	6.19	6.50	0.244	0.256
C	10.64	10.94	0.419	0.431
D	0.35	0.55	0.014	0.022
G	7.36 BSC		0.290 BSC	
H	2.54 BSC		0.100 BSC	
J	0.43	0.55	0.017	0.022
K	7.36	–	0.290	–
R	11.98	12.19	0.472	0.480
U	3.07	3.32	0.115	0.125
V	4.36	4.52	0.172	0.178
W	2.38	2.69	0.094	0.106
B1	0.88	1.14	0.035	0.045
C1	2.54 NOM		0.100 NOM	

NOTES:
1. DIMENSIONS R AND B ARE DATUMS AND T IS A DATUM SURFACE.
2. POSITIONAL TOLERANCE FOR LEAD DIMENSION J: ⌖ 0.13 (0.005) Ⓜ T B Ⓜ
3. POSITIONAL TOLERANCE FOR LEAD DIMENSION D: ⌖ 0.13 (0.005) Ⓜ T R Ⓜ B Ⓜ
4. DIMENSIONING AND TOLERANCING ARE PER Y14.5, 1973.

Case 354-01

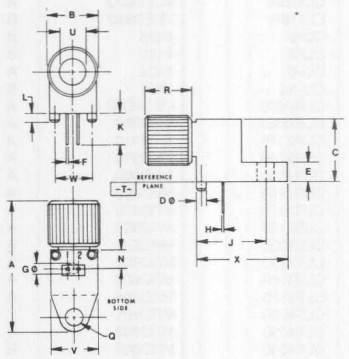


STYLE 1:
PIN 1. CATHODE
2. COLLECTOR
3. ANODE
4. EMITTER

DIM	MILLIMETERS MIN	MAX	INCHES MIN	MAX
A	24.13	25.01	0.950	0.985
B	6.19	6.50	0.244	0.256
C	10.64	10.94	0.419	0.431
D	0.35	0.55	0.014	0.022
E	6.24	6.55	0.246	0.258
G	7.36 BSC		0.290 BSC	
H	2.54 BSC		0.100 BSC	
J	0.43	0.55	0.017	0.022
K	7.36	–	0.290	–
L	19.05 BSC		0.750 BSC	
R	11.98	12.19	0.472	0.480
S	3.24	3.37	0.124	0.133
U	3.07	3.32	0.115	0.125
V	4.36	4.52	0.172	0.178
W	2.38	2.69	0.094	0.106
B1	0.88	1.14	0.035	0.045
C1	2.54 NOM		0.100 NOM	

NOTES:
1. DIMENSIONS A AND B ARE DATUMS AND T IS A DATUM SURFACE.
2. POSITIONAL TOLERANCE FOR MOUNTING HOLES: ⌖ Ø 0.36 (0.014) Ⓜ T A Ⓜ B Ⓜ
3. POSITIONAL TOLERANCE FOR LEAD DIMENSION J: ⌖ 0.13 (0.005) Ⓜ T B Ⓜ
4. POSITIONAL TOLERANCE FOR LEAD DIMENSION D: ⌖ 0.13 (0.005) Ⓜ T A Ⓜ B Ⓜ
5. DIMENSIONING AND TOLERANCING PER Y14.5, 1973.

Case 354A-01



STYLE 2:
PIN 1. EMITTER
2. COLLECTOR

DIM	MILLIMETERS MIN	MAX	INCHES MIN	MAX
A	18.67	19.05	0.735	0.750
B	9.14	9.39	0.360	0.370
C	7.75	8.12	0.305	0.320
D	1.52	1.72	0.060	0.068
E	2.41	2.66	0.095	0.105
F	0.43	0.60	0.017	0.024
G	2.54 BSC		0.100 BSC	
H	0.23	0.55	0.009	0.022
J	7.87	8.25	0.310	0.325
K	10.29	17.14	0.405	0.675
L	1.27	1.52	0.078	0.082
N	1.98	2.08	0.078	0.082
Q	3.05	3.30	0.120	0.130
R	7.49	8.00	0.295	0.315
U	3.56	3.81	0.140	0.150
V	6.86	7.11	0.270	0.280
W	5.33 BSC		0.210 BSC	
X	10.67	11.17	0.420	0.440

NOTES:
1. DIMENSIONS V AND X ARE DATUMS AND T IS A DATUM SURFACE.
2. POSITIONAL TOLERANCE FOR Ød (2 PL): ⌖ ⌀ 0.25 (0.010) Ⓜ T V Ⓜ X Ⓜ
3. POSITIONAL TOLERANCE FOR F DIMENSION (2 PL): ⌖ 0.25 (0.010) Ⓜ T V Ⓜ X Ⓜ
4. POSITIONAL TOLERANCE FOR H DIMENSION (2 PL): ⌖ 0.25 (0.010) Ⓜ T V Ⓜ X Ⓜ
5. DIMENSIONING AND TOLERANCING PER ANSI Y14.5, 1982.
6. CONTROLLING DIMENSION: INCH.

Case 363-01

Cross-Reference

The following cross-reference is meant to serve as a substitution guide for existing competitive devices to Motorola's optoelectronic product line.

Motorola's nearest equivalent devices are selected on the basis of general similarity of electrical characteristics and mechanical configuration. Interchangeability in particular applications is not guaranteed. Before using a substitute, please compare the detailed specifications of the substitute device to the data sheet of the original device.

In the event the device we recommend does not exactly meet your needs, we encourage you to refer to the Selector Guide for another device from the same line source which will have similar characteristics, or contact your nearest distributor or Motorola sales office for further information.

CODE

A = Direct Replacement
B = Minor Electrical Difference
C = Minor Mechanical Difference
D = Significant Electrical Difference
E = Significant Mechanical Difference

Industry Device	Motorola Equivalent	Code
BP101	MRD3050	C
BP102	MRD3050	C
BPW14	MRD300	A
BPW15	MRD602	A
BPW24	MRD701	E
BPW30	MRD360	A
BPX25A	MRD370	A
BPX25	MRD300	A
BPX29A	MRD370	A
BPX29	MRD310	A
BPX37	MRD300	A
BPX38	MRD3055	A
BPX43	MRD300	A
BPX58	MRD300	A
BPX59	MRD360	A
BPX62-1	MRD601	A
BPX62-2	MMD602	A
BPX62-3	MRD603	A
BPX62-4	MRD604	A
BPY62	MRD3055	A
CL100	MLED930	B
CL110	MLED930	A
CL110A	MLED930	A
CL110B	MLED930	B
CLI-2	4N38	B
CLI-3	4N35	B
CLI-5	4N26	A
CLI-10	4N33	B
CLR2050	MRD3050	A
CLR2060	MRD360	A
CLR2110	MRD310	A
CLR2140	MRD310	A
CLR2150	MRD300	A
CLR2160	MRD300	A
CLR2170	MRD370	A
CLR2180	MRD360	A
CLT3020	MRD601	A
CLT3030	MRD602	A
CLT3160	MRD603	A
CLT3170	MRD604	A
CLT4020	MRD601	E
CLT4030	MRD602	E
CLT4060	MRD603	E
CLT4070	MRD604	E
CNY17	CNY17	A
CNY18	4N25	A
CNY21	4N25	E
CQY10	MLED930	B
CQY11, B, C	MLED930	B
CQY12, B	MLED930	B
CQY13	4N26	B
CQY14	4N25	B
CQY15	4N26	B
CQY31	MLED930	B
CQY32	MLED930	B
CQY40, 41	4N26	A
CQY80	MOC1005	B
EP2	4N26	B
EPY62-1	MRD3055	A
EPY62-2	MRD3056	A

Industry Device	Motorola Equivalent	Code
EPY62-3	MRD310	A
FCD810,A	4N28	A
FCD810, B, C, D	4N28	A
FCD820, A	TIL116	A
FCD820, B	TIL116	A
FCD820, C, D	TIL116	A
FCD825, A	TIL117	B
FCD825, B	TIL117	B
FCD825,C, D	TIL117	B
FCD830, A	TIL116	B
FCD830, B	TIL116	B
FCD830, C, D	TIL116	B
FCD831, A	TIL116	B
FCD831, B	TIL116	B
FCD831, C, D	TIL116	B
FCD836	4N28	B
FCD836, C, D	4N28	B
FCD850, C, D	4N29	B
FCD855, C, D	H11B255	A
FCD860, C, D	Special	
FPE100	MLED930	A
FPE410	MLED930	B
FPE500	MLED930	B
FPE520	MFOE200	D
FPT120, C	MRD300	B
FPT400	MRD360	A
FPT500, A	MRD300	A
FPT510	MRD3054	A
FPT510, A	MRD3055	A
FPT520	MRD300	A
FPT520A	MRD300	B
FPT530A	MRD300	A
FPT450A	MRD300	B
FPT550A	MRD300	B
FPT560	MRD300	B
FPT570	MRD360	A
GG686	MRD300	B
GS101	MRD601	A
GS103	MRD601	A
GS161	MRD601	A
GS163	MRD601	A
GS165	MRD604	A
GS167	MRD604	A
GS201	MRD601	E
GS203	MRD601	E
GS261	MRD601	E
GS263	MRD601	E
GS265	MRD604	E
GS267	MRD604	E
GS501	MRD604	E
GS503	MRD601	E
GS561	MRD601	E
GS567	MRD604	E
GS600, 3, 6, 9, 10	MRD300	A
GS612	MRD3050	A
GS670	MRD3050	A
GS680	MRD300	A
GS683	MRD300	A
GS686	MRD300	A
H11A1	H11A1	A

Industry Device	Motorola Equivalent	Code
H11A2	H11A2	A
H11A3	H11A3	A
H11A4	H11A4	A
H11A5	H11A5	A
H11A520	H11A520	A
H11A550	H11A550	A
H11A5100	H11A5100	A
H74A1	4N26	B
H11AA1	H11AA1	A
H11AA2	H11AA2	A
H11B1	H11B1	A
H11B2	H11B2	A
H11B3	H11B3	A
H11B255	H11B255	A
H11C1, 2, 3	H11C1, 2, 3	A
H11C4, 5, 6	MOC3020	DE
H11D1, 2, 3, 4	H11D1, 2, 3, 4	A
H11G1, 2, 3	H11G1, 2, 3	A
H11J1	MOC3011/H11J1	A
H11J2	MOC3010/H11J2	A
H11J3	MOC3011/H11J3	A
H11J4	MOC3010/H11J4	A
H11J5	H11J5	A
H11L1	MOC5007/H11L1	A
H11L2	MOC5009/H11L2	A
H21A1	MOC7811/H21A1	A
H21A2	MOC7812/H21A2	A
H21A3	MOC7813/H21A3	A
H22A1	MOC7821/H22A1	A
H22A2	MOC7822/H22A2	A
H22A3	MOC7823/H22A3	A
H74C1	H74C1	A
H74C2	MOC3020	DE
IL1	IL1	A
IL5	4N25	B
IL12	IL12	A
IL15	IL15	A
IL16	IL16	A
IL74	IL74	A
IL250	H11AA1	A
ILA30	4N33	B
ILA55	4N33	B
ILCA2-30	MCA230	A
ILCA2-55	H11B255	A
IRL40	MLED930	B
L8, L9	MRD3011	D
L14F1	MRD360	A
L14F2	MRD370	A
L14G1	MRD300	A
L14G2	MRD310	A
L14G3	MRD310	A
L14H1	MRD701	DE
L14H2	MRD701	DE
L14H3	MRD701	DE
L14H4	MRD701	DE
L15E	MRD603	A
L15A	MRD602	A
L15AX601	MRD601	A
L15AX602	MRD602	A
L15AX603	MRD603	A

CROSS-REFERENCE (continued)

Industry Device	Motorola Equivalent	Code
L15AX604	MRD604	A
LED56, F	MLED930	A
MCA11G1	H11G1	A
MCA11G2	H11G2	A
MCA230	MCA230	A
MCA231	MCA231	A
MCA255	MCA255	A
MCP3009	MOC3009	A
MCP3010	MOC3010	A
MCP3011	MOC3011	A
MCP3020	MOC3020	A
MCP3021	MOC3021	A
MCP3022	MOC3022	A
MCS2	MCS2	A
MCS2400	MOC3020	DE
MCT2	MCT2	A
MCT2E	MCT2E	A
MCT26	MCT26	A
MCT271	MCT271	A
MCT272	MCT272	A
MCT273	MCT273	A
MCT274	MCT274	A
MCT275	MCT275	A
MCT277	MCT277	A
MCT2200	MOC602A	A
MCT2201	MOC604A	A
MFOD102F	MFOD1100	E
MFOD104F	MFOD1100	E
MFOD110F	MFOD1100	E
MFOD202F	MFOD2202	E
MFOD302F	MFOD2302	E
MFOD404F	MFOD2404	E
MFOD405F	MFOD2405	E
MFOE102F	MFOE1200	E
MFOE103F	MFOE1200	E
MFOE106F	MFOE1200	E
MFOE107F	MFOE1201	E
MFOE108F	MFOE1202	E
MLED92	MLED71	E
MLED93	MLED71	E
MLED94	MLED71	E
MLED95	MLED71	E
MOC1000	4N26	A
MOC1001	4N25	A
MOC1002	4N27	A
MOC1003	4N28	A
MOC1200	4N29	A
MRD14B	MRD711	E
OP123	MLED910	A
OP124	MLED910	A
OP130	MLED930	A
OP131	MLED930	A
OP600	MRD601	A
OP601	MRD601	A
OP602	MRD602	A
OP603	MRD603	A
OP604	MRD604	A
OP640	MRD601	A
OP641	MRD601	A
OP642	MRD602	A
OP643	MRD602	A
OP644	MRD603	A
OP800	MRD3055	A
OP801	MRD3050	A
OP802	MRD310	A
OP803	MRD300	A
OP804	MRD300	A
OP805	MRD300	A
OP830	MRD300	A
OPI110	MOC1005	DE
OPI2150	4N28	A
OPI2151	4N28	A
OPI2152	4N26	A
OPI2153	TIL117	A
OPI2250	4N28	A
OPI2251	4N28	A
OPI2252	4N26	A
OPI2253	TIL117	A

Industry Device	Motorola Equivalent	Code
OPI2500	H11AA1	A
OPI3009	MOC3009	A
OPI3010	MOC3010	A
OPI3011	MOC3011	A
OPI3012	MOC3012	A
OPI3020	MOC3020	A
OPI3021	MOC3021	A
OPI3022	MOC3022	A
OPI3023	MOC3023	A
OPI3150	4N33	A
OPI3151	4N33	A
OPI3250	4N33	A
OPI3251	4N33	A
OPI4201	H11C1	A
OPI4202	H11C3	A
OPI5000	H11A520	A
OPI5010	H11A520	A
OPI6000	MOC8204	A
OPI6100	MOC8205	A
PC503	4N26	A
SCS11C1	H11C1	A
SCS11C3	H11C3	A
SD1440-1,-2,-3,-4	MRD3050	DE
SD2440-1	MRD601	A
SD2440-2	MRD602	A
SD2440-3	MRD603	A
SD2440-4	MRD604	A
SD2441-1	MRD602	A
SD2441-2	MRD603	A
SD2441-3	MRD604	A
SD2441-4	MRD604	B
SD3420-1,-2	MRD510	A
SD5400-1	MRD370	A
SD5400-2	MRD360	A
SD5400-3	MRD360	A
SD5420-1	MRD500	A
SD5440-1	MRD3052	A
SD5440-2	MRD3056	A
SD5440-3	MRD300	A
SD5440-4	MRD300	B
SD5442-1,-2,-3	MRD300	B
SE1450 series	MLED930	E
SE2450 series	MLED910	B
SE2460 series	MLED910	B
SE5450 series	MLED930	A
SE5451 series	MLED930	B
SG1001 series	MLED910	B
SPX2	4N35	A
SPX2E	4N35	A
SPX4	4N35	A
SPX5	4N35	A
SPX6	4N35	A
SPX26	4N27	A
SPX28	4N27	A
SPX35	4N35	A
SPX36	4N35	A
SPX37	4N35	A
SPX53	H11A550	A
SPX103	4N35	A
SPX1872-1	MOC7821/H22A1	C
SPX1872-2	MOC7821/H22A1	C
SPX1873-1	MOC7811/H21A1	C
SPX1873-2	MOC7811/H21A1	C
SPX1876-1	MOC7811/H21A1	C
SPX1876-2	MOC7811/H22A2	C
SPX2762-4	MOC7822/H22A2	C
SPX7271	CNY17-1	A
SPX7272	CNY17-2	A
SPX7273	CNY17-3	A
SSL4, F	MLED930	B
SSL34, 54	MLED930	B
STPT20	MRD604	A
STPT21	MRD601	A
STPT25	MRD603	A
STPT51	MRD3050	A
STPT53	MRD3056	A
STPT60 series	MRD601 series	A
STPT80	MRD3056	A

Industry Device	Motorola Equivalent	Code
STPT81	MRD3052	A
STPT82	MRD3053	A
STPT83	MRD3054	A
STPT84	MRD3056	A
STPT260	MRD360	A
STPT300	MRD300	A
STPT310	MRD360	C
TIL23	MLED910	A
TIL24	MLED910	B
TIL31	MLED930	B
TIL33	MLED930	B
TIL34	MLED930	A
TIL63	MRD3050	A
TIL64	MRD3050	A
TIL65	MRD3052	A
TIL66	MRD3054	A
TIL67	MRD3056	A
TIL81	MRD300	A
TIL111	TIL111	A
TIL112	TIL112	A
TIL113	TIL113	A
TIL114	TIL114	A
TIL115	TIL115	A
TIL116	TIL116	A
TIL117	TIL117	A
TIL118	TIL118	A
TIL119	TIL119	A
TIL124	TIL124	A
TIL125	TIL125	A
TIL126	TIL126	A
TIL127	TIL127	A
TIL128	TIL128	A
TIL153	TIL153	A
TIL154	TIL154	A
TIL155	TIL155	A
TIL156	TIL156	A
TIL157	TIL157	A
TIL601	MRD601	A
TIL602	MRD602	A
TIL603	MRD603	A
TIL604	MRD604	A
TLP501	4N27	B
TLP503	4N25	B
TLP504	4N25	B
1N5722	MRD601	A
1N5723	MRD602	A
1N5724	MRD603	A
1N5725	MRD604	A
2N5777	MRD711	DE
2N5778	MRD711	DE
2N5779	MRD711	DE
2N5780	MRD711	DE
2N25, A	4N25, A	A
4N26	4N26	A
4N27	4N27	A
4N28	4N28	A
4N29, A	4N29, A	A
4N30	4N30	A
4N31	4N31	A
4N32, A	4N32, A	A
4N33	4N33	A
4N35	4N35	A
4N36	4N36	A
4N37	4N37	A
4N38, A	4N38, A	A
4N39	4N39	A
4N40	MOC3020	DE
5082-4203	MRD500	A
5082-4204	MRD500	A
5082-4207	MRD500	A
5082-4220	MRD500	A

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Le Relecq-Kerhuon — Tel. (98) 28 03 03
FEUTRIER ILE DE FRANCE
Nantes — Tel. (40) 48 09 44
FEUTRIER ILE DE FRANCE
Rennes — Tel. (99) 30 35 78
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EBV Elektronik Vertriebs-GmbH
Düsseldorf — Tel. (0211) 848 46
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Möglingen — Tel. (07141) 48 71
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